inputting conversion table data where combinations of plural color component data are arranged by grid points;

sorting the conversion table data in a color component unit; and

compressing the sorted conversion table data.

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15. (Cancelled)

REMARKS

Claims 1 to 7, 10 and 12 to 14 are pending in the application, with Claims 1 to 7, 10, 13 and 14 having been amended, and with Claims 8, 9, 11 and 15 having been cancelled herein. Reconsideration and further examination are respectfully requested.

Claims 1 to 11, 13 and 15 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,108,008 (Ohta) in view of U.S. Patent No. 5,317,426 (Hoshino); and Claims 12 and 14 were rejected under § 103(a) over U.S. Patent No. 6,204,933 (Yoshino) in view of Hoshino. Reconsideration and withdrawal of these rejections are respectfully requested.

Turning to specific claim language, amended independent Claim 1 is directed to an image processing apparatus for converting input color data to color component data to be outputted by using a conversion table. The apparatus includes a first storage, arranged to store at least one compressed conversion table, wherein data of the compressed conversion table are arranged based on positions of grid points in a color component unit, an expander, arranged to expand the compressed conversion table, and a

-5-

converter, arranged to convert the input color data to the color component data using the expanded conversion table.

Accordingly, the invention of amended independent Claim 1 utilizes a compressed conversion table which can be expanded and then used in the conversion of color image data, thereby reducing the necessary storage capacity required for the conversion process. (Specification, page 2, line 14, to page3, line 9). In the present invention, the conversion table is compressed by arranging the data in the conversion table based on positions of grid points in a color component unit. (Figures 2A to 2C). According to such an arrangement continuance of the same value is increased and therefore a compression rate of the conversion table is improved. (Figure 3; and specification, page 10, line 7, to page 11, line 12).

The applied art, namely Ohta and Hoshino, are not seen to disclose or suggest the foregoing features of amended independent Claim 1. In particular, the applied art is not seen to disclose or suggest storing at least one compressed conversion table, wherein the data of the compressed conversion table are arranged based on positions of grid points in a color component unit, and an expander, arranged to expand the compressed conversion table for subsequent use in conversion of input color data.

Specifically, Ohta is seen to be concerned with rendering a preview image as it would appear if it were formed by a predetermined image device, wherein the rendered preview image is created using a stored profile which corresponds to the predetermined image forming device. (Ohta, abstract; Figure 2; and column 1, lines 60 to 67). Although Ohta is seen to disclose the use of three-dimensional look-up tables (LUT) for converting Lab color space to CMYK color space, the three-dimensional look-up tables

- 6 -

in Ohta are not seen to be compressed and are not seen to have the data contained therein arranged based on positions of grid points in a color component unit. (Ohta, column 13, lines 20 to 48).

Accordingly, Ohta is not seen to have the advantage of the present invention in which the required storage capacity for the conversion process is reduced because the use of a compressed conversion table is used in the conversion process. In this regard, Hoshino is not seen to remedy the foregoing deficiencies of Ohta. In particular, Hoshino is seen to be directed to transforming a color image from a first color gamut to a second color gamut. (Hoshino, abstract; and column 3, lines 1 to 45). Hoshino is seen to use look-up tables 211 to 213 in order to convert CMYK image data to compressed CMYK image data. (Hoshino, column 6, lines 40 to 45). The compressed CMYK image data is then converted to RGB image data for display on a color CRT. (Hoshino, column 6, lines 46 to 49). However, look-up tables 211 to 213 of Hoshino are seen to constitute a first color conversion means, but are not seen to themselves be compressed. Instead, they are simply seen to be used to output compressed image data. (Hoshino, column 6, lines 40 to 56). In particular, the term "compressed" as used in Hoshino is seen to be directed to converting CMYK print data to CMYK print data as it would be rendered by a printing device having a compressed color gamut. (Hoshino, column 7, lines 55 to 58). The color image data as it would be rendered by the compressed color gamut of the output device is then converted to RGB for display on the CRT so as to provide a preview of the color image data as it would appear in the compressed color gamut of the output printing device. (Hoshino, column 6, lines 30 to 54). However, nowhere is Hoshino seen to disclose or suggest that the look-up tables 211 to 213 themselves are compressed in size so as to reduce the required storage

- 7 -

capacity as in amended independent Claim 1. Instead, Hoshino is seen to obtain a large number of values for the colorimetric conversion performed by look-up tables 211 to 213. (Hoshino, column 8, lines 8 to 31; and column 9, lines 44 to 68).

Accordingly, although Hoshino is seen to use a standard look-up table to convert color image data to a compressed color image space, none of the look-up tables disclosed in Hoshino are seen to be themselves compressed, much less wherein the data of the conversion table is arranged based on positions of grid points in a color component unit. Applicant respectfully submits that Ohta and Hoshino, either alone or in combination, are not seen to disclose or suggest the foregoing combination of amended independent Claim 1. (M.P.E.P. § 2143).

Based on the foregoing amendments and remarks, amended independent Claim 1 is seen to be in condition for allowance, and such action is respectfully requested. In addition, amended independent Claim 7 is directed to an image processing method and amended independent Claim 13 is directed to a computer program, both of which include substantially similar features as those of amended independent Claim 1 and therefore are also believed to be in condition for allowance for the same reasons discussed above with respect to amended independent Claim 1.

Amended independent Claim 12 is directed to a data processing method for processing data used in data conversion. The method includes the steps of inputting conversion table data where combinations of plural color component data are arranged by grid points, sorting the conversion table data in a color component unit, and compressing the sorted conversion table data.

The applied art, namely Ohta, Hoshino and Yoshino, is not seen to disclose

or suggest the foregoing features of independent Claim 12. In particular, the applied art is

not seen to disclose or suggest inputting conversion table data where combinations of

plural color component data are arranged by grid points, sorting the conversion table data

in a color component unit, and compressing the sorted conversion table data.

According to the invention of independent Claim 12, the data of the

conversion table is appropriately sorted before being compressed, thereby resulting in

efficient compression while maintaining accurate color conversion. (Figures 2A to 2C and

Figure 3) As stated above, Hoshino is not seen to disclose or suggest that look-up tables

211 to 213 of Hoshino are themselves actually compressed, but are instead seen to merely

be used to convert CMYK image data to CMYK image data in a compressed color space.

(Hoshino, column 6, lines 40 to 54). In addition, as admitted in the Office Action, Hoshino

is not seen to disclose or suggest sorting the conversion table data in a color component

unit.

In this regard, Yoshino is not seen to remedy the foregoing deficiencies of

Hoshino with respect to independent Claim 12. In particular, Yoshino is seen to be

directed to the use of compressed image data to pass to a printer which expands the

compressed image data for printing, for efficient print data transmission and memory use.

(Yoshino, abstract; and column 2, lines 1 to 15). It is stated in the Office Action that

Yoshino teaches sorting the conversion table data in a color component unit. Applicant

respectfully disagrees with this assertion. In particular, the portion of Yoshino cited by the

Examiner is simply seen to be related to the process performed by color laser printer 21a as

shown in the flowchart of Figure 16. In this regard, in the case of processing a color print,

color laser printer 21a sets a sort of table necessary to carry out the color processing. (Yoshino, column 9, lines 45 to 51). In all fairness, Applicant submits that this description of setting a necessary color processing table merely means that a necessary "sort" of table is selected, and cannot be seen to mean that the table itself is sorted, much less wherein the data within the table is sorted in a color component unit. Instead, Yoshino is simply to select a sort of table necessary for color processing from either a memory within the printer or from personal computer 20a. (Yoshino, column 9, lines 45 to 51).

In addition, Yoshino is not seen to disclose or suggest that a conversion table itself is compressed. Accordingly, Hoshino and Yoshino, either alone or in combination, are not seen to disclose or suggest the combination of features of independent Claim 12. Accordingly, independent Claim 12 is believed to be in condition for allowance, and such action is respectfully requested. In addition, amended independent Claim 14 is directed to a computer program product which includes substantially similar features as those of independent Claim 12, and therefore is also believed to be in condition for allowance for the same reasons discussed above with respect to independent Claim 12.

The other pending claims in this application are each dependent from the independent claims discussed above and are therefore believed patentable for the same reasons. Because each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicant's undersigned attorney may be reached in our Costa Mesa, CA office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

1. (Amended) An image processing apparatus for <u>converting input color data to color component</u> [generating image] data to be outputted by using [data] <u>a</u> conversion <u>table</u>, said apparatus comprising:

a first storage<u>, arranged to store at least one</u> [means for storing] compressed conversion table<u>, wherein</u> data <u>of the</u> [having] compressed [grid point data of a] conversion table <u>are</u> arranged <u>based on positions of grid points in a</u> [by] color <u>component unit</u> [components which are used to construct the image data to be outputted];

<u>an expander, arranged to expand</u> [expansion means for expanding] the compressed conversion table [data]; and

<u>a converter, arranged to convert the input color</u> [conversion means for performing said] data <u>to the color component data using</u> [conversion by interpolation operation based on] the expanded conversion table [data].

2. (Amended) The apparatus according to claim 1, further comprising <u>a</u> second storage <u>arranged to store</u> [means for storing] the expanded conversion table [data].

3. (Amended) The apparatus according to claim 1, wherein said converter converts [data conversion is a process of converting] color space [of image data].

4. (Amended) The apparatus according to claim 1, wherein the color component [said] data [conversion] includes a black [complementary] color component [conversion and under color removal].

5. (Amended) The apparatus according to claim 1, further comprising a sorter arranged to sort data included in [sorting means for sorting] the expanded conversion table while [data to generate] a combination of output [plural] color components of a [component data arranged by] grid [points] point is kept.

6. (Amended) The apparatus according to claim 1, further comprising:

an input section, arranged to input [means for inputting] a command indicative of print instruction and data indicative of a print medium characteristic; and

a selector, arranged to select one [control means for expanding a plurality of conversion table data for a plurality] of conversion tables expanded by said expander in accordance with [corresponding to] the data indicative of the print medium characteristic[, and performing said data conversion by using a conversion table appropriate for a characteristic of inputted image data].

7. (Amended) An image processing method <u>of converting input color data</u> <u>to color component</u> [for generating image] data to be outputted by using [data] <u>a</u> conversion <u>table</u>, said method comprising the steps of:

expanding <u>a</u> compressed conversion table<u>, wherein</u> data <u>of the</u> [having] compressed [grid point data of a] conversion table <u>are</u> arranged <u>based on positions of grid</u> <u>points in a</u> [by] color <u>component unit</u> [components which are used to construct the image data to be outputted]; and

<u>converting the input color</u> [performing said] data <u>to the color component</u> <u>data using</u> [conversion by interpolation operation based on] the expanded conversion table [data].

10. (Amended) The method according to claim 7, further comprising the step of sorting <u>data included in</u> the expanded conversion table <u>while</u> [data to generate] a combination of <u>output</u> [plural] color <u>components of a</u> [component data arranged by] grid [points] <u>point is kept</u>.

13. (Amended) A computer program product <u>storing</u> [comprising] a computer readable medium having computer program code, for <u>converting input color data</u> <u>to color component</u> [generating image] data to be outputted by using data conversion <u>table</u>, said product comprising <u>process procedure codes for</u>:

[expansion procedure code for] expanding a compressed conversion table,

wherein data of the [having] compressed [grid point data of a] conversion table are

arranged based on positions of grid points in a [by] color component unit [components

which are used to construct the image data to be outputted]; and

[conversion procedure code for performing said] converting data to the

color component data using [conversion by interpolation operation based on] the expanded

conversion table [data].

14. (Amended) A computer program product storing [comprising] a

computer readable medium having computer program code for processing data used in data

conversion, said product comprising process procedure codes for:

[input procedure code for] inputting conversion table data where

combinations of plural color component data are arranged by grid points;

[sorting procedure code for] sorting the conversion table data in a color

component unit; and

[compression procedure code for] compressing the sorted conversion table

data.

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